

# 2023 Drop Tower Challenge

## DIVER: Diving into Experimental Research



<https://www1.grc.nasa.gov/space/education-outreach/drop-tower-competition/>

**WHAT?** Teams of grade 8-12 students are challenged to design and build simple devices which in normal gravity will float in water, but which will submerge as far as possible because of wetting characteristics when they experience apparent weightlessness, i.e., microgravity, in NASA's [2.2 Second Drop Tower](#) (shown below). An example diving test can be seen at [www.youtube.com/watch?v=wOqYct-n2ts](http://www.youtube.com/watch?v=wOqYct-n2ts).

Teams are only responsible for their diving devices, where NASA will provide the rest of the experimental hardware. After developing their concept(s), the youth prepare their proposal, consisting of conceptual drawing(s) and a short entry form, which is e-mailed to [Ed-DropTower@lists.nasa.gov](mailto:Ed-DropTower@lists.nasa.gov).

If selected, the youth prepare their unique diving devices per guidelines provided on the challenge [website](#). The devices are then sent to NASA where they will fall 24 meters (79 feet). Video results are provided for student analysis and reporting.



**WHO?** This design challenge is for students in grades 8-12 from U.S. schools, including the fifty states, District of Columbia, Puerto Rico, American Samoa, Guam, the Northern Mariana Islands, the U.S. Virgin Islands, and all [DODEA](#) schools (which are for children of U.S. military personnel). Except for the DODEA schools, this challenge is not open to participants outside of the United States regardless of citizenship.

Teams, which can be of any size, will be favored over individuals in selection. Youth are free to get help from adults, for example in building their experiment hardware. An organization (e.g., school, science center, 4H club, Scout troop, group of friends) may submit no more than four proposals, where it is envisioned that no more than two will be selected from a single organization. Each student may belong to no more than one team, which may submit no more than one proposal.

**SELECTION?** NASA anticipates selecting up to 20 teams to build objects to be tested at the Glenn Research Center in Cleveland, Ohio. After evaluation of the experimental results and teams' reports, a small number of top-performing teams will be invited to present their results in a student poster session at the 2023 meeting of the American Society for Gravitation and Space Research ([ASGSR](#)).



**WHERE?** Participation is remote, where participants do not travel to NASA for the testing. An exception is for those teams invited to present their results at the 2023 ASGSR meeting, but the location will not be announced until Nov. 2022.

**COST?** There is no cost to participate in the challenge other than for (1) the preparation of the test objects, (2) the shipment of the test objects to NASA, and (3) travel costs for those invited to present their results at the ASGSR meeting. Regarding the latter, the ASGSR has normally provided travel support of \$500 each for invited non-local students who present their results at the conference.



Testing in the 2.2 Second Drop Tower

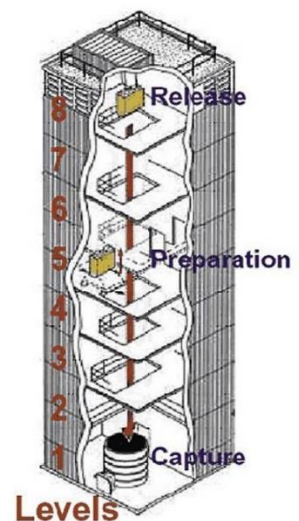
### WHEN?

2022	Nov. 13	deadline for proposal
	Early December	NASA announces teams selected for testing
2023	Jan.-February	preparation of test objects
	Feb. 13	deadline for arrival of test objects at NASA
	Feb.-March	testing in NASA's 2.2 Second Drop Tower
	April	analysis and report writing
	May 1	deadline for written report
	Mid-May	NASA announces teams selected for ASGSR participation
	Fall 2023	annual ASGSR meeting (probably in early Nov.)

**WHY?** The odds are quite good that your team will be selected for testing. Thus far, 100% of the proposing teams have been selected for participation in this series of problem-based drop tower challenges. Participation in a nation-wide NASA challenge could be good to include in college applications.

### HINTS

- Design and build multiple test objects so that you can compare and contrast their results in your report and poster too if invited to present at the ASGSR meeting.
- Conduct your own microgravity trials. For inspiration, check out the [Fire in Free Fall](#) video by [Dianna Cowern](#). The challenge staff can provide additional guidance.



**QUESTIONS?** Answers can be found at <https://www1.grc.nasa.gov/space/education-outreach/drop-tower-competition/>. If that doesn't suffice, email the challenge staff at [Ed-DropTower@lists.nasa.gov](mailto:Ed-DropTower@lists.nasa.gov).